

# MULTIMEDIA

## a VIRTUAL experience

**Web Instructions:** To gain World Wide Web access to additional and up-to-date information regarding this special feature, launch your browser and enter the URL shown at the top of this page.

### INTERACTIVE MULTIMEDIA

#### Changing the Way We Work, Learn, and Play

Watch the Air Force Thunderbirds perform their daring aerobatic feats. Travel to Egypt and view King Tut's tomb. Watch the space shuttle blast into orbit. With multimedia, you can have all these adventures without setting foot outside your house (Figure 1). **Multimedia** refers to using computers to integrate text, graphics, animation, audio, and video into one application.

#### Interactive Multimedia

Unlike television, which combines and presents these media in a predefined order, most multimedia applications are interactive. Users participate directly with the application. **Interactive multimedia** present information in various ways with a variety of media elements. Users choose the material to view, define the order in which it is presented, and obtain feedback on these actions. The computer accepts input through a keyboard, voice, or pointing device — such as a mouse — and performs an action in response.

Interactivity makes multimedia well suited for applications such as video games, flight simulators, virtual reality, electronic magazines, and educational and training tutorials. The multimedia application shown in Figure 2, for example, allows you to select from numerous geographical locations to learn about diving expeditions into the U.S. National Marine Sanctuaries and other regions.

### MULTIMEDIA APPLICATIONS

A **multimedia application** uses technology for business, education, and entertainment. Businesses use multimedia, for example, in interactive advertisements and for job- and skill-training applications. Teachers use multimedia applications to deliver classroom presentations that enhance student learning.

**Figure 2**

This National Geographic Web site consists of text and graphics and links to diving expeditions.



**Figure 1**

Today, interactive multimedia plays an increasingly important role in business, industry, education, and entertainment.



Students, in turn, use multimedia applications to learn by reading, seeing, hearing, and interacting with the subject content. A wide variety of computer games and other types of entertainment also use multimedia applications.

Another important application of multimedia is to create **simulations**, which are computer-based models of real-life situations. Multimedia simulations often replace costly and sometimes hazardous demonstrations and training in areas such as chemistry, biology, medicine, and aviation.

The following sections provide a more detailed look at the various types of multimedia applications, such as business presentations, computer- and Web-based training and education, electronic books and references, how-to guides, and magazines. The sections also address the use of multimedia for leisure activities, virtual reality, and kiosks, as well as its importance on the World Wide Web.

## Business Presentations

Many businesses and industries use multimedia to create marketing presentations that advertise and sell products. Advertisers, for instance, save time and money by using this software to produce television commercials with unique media effects. Sales representatives also use multimedia in marketing presentations created using presentation graphics software. To deliver these presentations to a large audience, users can connect their computer to a video projector that displays the presentation on a full screen (Figure 3).

## Computer-Based Training

Students use **computer-based training (CBT)** to learn and complete exercises with instructional software, such as the Learn By Series shown in Figure 4. Also called **computer-aided instruction (CAI)**, computer-based training is popular in business, industry, and schools to teach new skills or to enhance the existing skills of employees, teachers, or students. Athletes, for example, use multimedia computer-based training programs to learn the intricacies of baseball, football, soccer, tennis, and golf skills, while airlines use multimedia CBT simulations to train employees for emergency situations. Schools use CBT to train teachers in various disciplines and to teach students math, language, and software skills. Interactive CBT software called **courseware** usually is available on CD-ROM or DVD-ROM or shared over a network.

Computer-based training allows for flexible, on-the-spot training. Businesses, for example, can set up corporate training labs, so employees can update their skills without leaving the workplace. Installing CBT software on an employee's computer or on the company network provides even more flexibility by allowing employees to update their job skills at their desks, at home, or while traveling.

Computer-based training provides a unique learning experience because



**Figure 3**

Video projectors connected to a computer can display images brightly and clearly. Some projectors are as small and lightweight as a laptop computer.

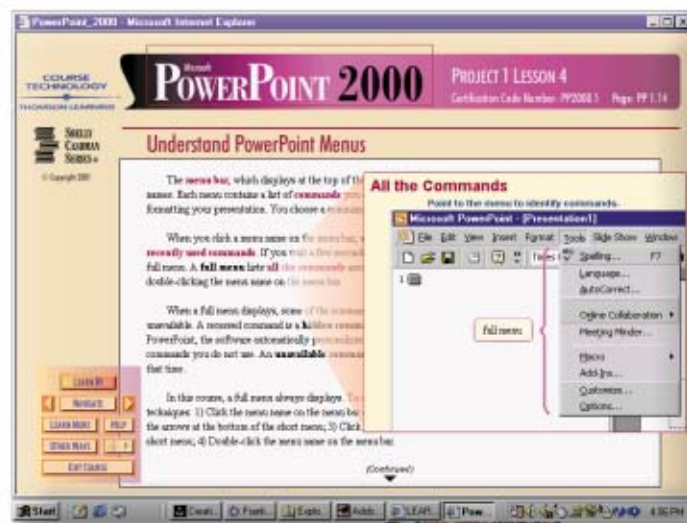


**Figure 4**

Computer-based training, such as the Learn By Series, is designed so students can choose learning activities that complement their learning styles. Four distinctive Learn By activities and a simulated environment where students use their skills guarantee an effective learning experience.

WORK • LEARN • PLAY

learners receive instant feedback in the form of positive responses for correct answers or actions, additional information on incorrect answers, and immediate scoring and results. Testing and self-diagnostic features allow instructors to verify that a learner has mastered curriculum objectives and identify those who need additional instruction or practice. CBT is especially effective for teaching software skills if the CBT is integrated with the software application because it allows students to practice using the software as they learn.

Some of the many other advantages of CBT over traditional training include self-paced study, reduced time and costs, and unique multimedia content. Many CBT trainers find they can increase their time helping trainees because computers handle test delivery and grading.

## Web-Based Training (WBT) and Distance Learning

**Web-based training (WBT)** is an approach to computer-based training (CBT) that employs the technologies of the Internet and the World Wide Web. As with CBT, Web-based training typically consists of self-directed, self-paced instruction on a topic. Because it is delivered via the Web, however, WBT has the advantage of being able to offer up-to-date content on any type of computer platform.

During the past few years, the number of organizations using Web-based training has exploded. Today, many major corporations in the United States provide employees with some type of Web-based training to teach new skills or to upgrade their current skills.

Web-based training, computer-based training, and other materials often are used as materials for distance learning courses. **Distance learning**, also called **distance education**, is the delivery of education at one location while the learning takes place at other locations. Some national and international corporations also save millions of dollars by using distance learning to train employees, thus eliminating the costs of airfare, hotels, and meals for centralized training sessions.

Many colleges and universities offer numerous distance learning courses, usually in the form of Web-based or Web-enhanced courses (Figure 5). Web-based courses offer many advantages for students who live far from a college campus or work full time, allowing them to complete course work from home at any time that fits their schedules. A number of colleges and universities now offer master's and doctorate degree programs in which every required course is taught over the Web.

Web-based training also is available for individuals at home or at work. Today, anyone with access to the Web can take advantage of hundreds of multimedia tutorials offered online. Such tutorials cover a wide range of topics, from how to change a flat tire to creating presentations in PowerPoint. Many of these Web sites are free (Figure 6); others ask users to register and pay a fee to take the complete Web-based course.

## Classroom and Special Education

Multimedia applications also are used to teach students in grades from kindergarten through college. From interactive CD-ROMs and DVD-ROMs to presentations,

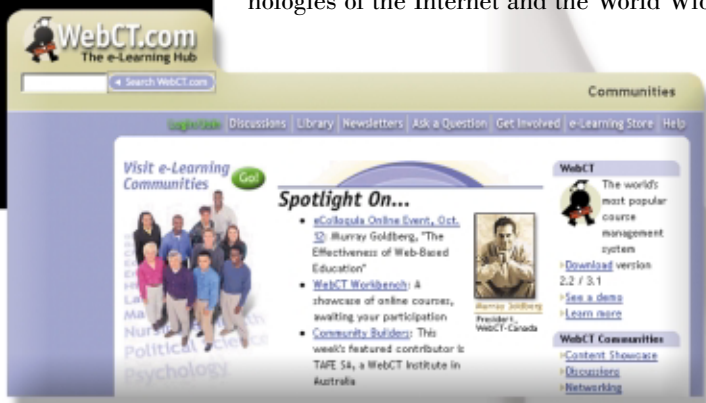


**Figure 5**  
Many colleges and universities offer some of their classes in a distance learning format.

**Figure 6**  
This Learn2 2torial explains how to install the best sound for your computer system in 10 minutes. The Web site offers practical and straightforward steps for a variety of activities on such diverse topics as obtaining a line of credit and repairing a surfboard ding.



multimedia can be an effective tool for delivering educational material to potential learners, making learning more exciting and interesting. Isolated rural schools often are leaders in connecting classrooms to the Internet and using multimedia applications to enhance learning.

This software makes the learning process more interesting, allows students to perform experiments in a risk-free environment, and provides instant feedback and testing. Virtual dissection of a frog is possible, for example, as shown in Figure 7. CBT also appeals to various learning styles and provides a new type of learning experience. A student using a CBT study guide, for example, could listen to a speaker reciting French vocabulary to help with the pronunciation of difficult words. You can buy many CBT programs such as these on CD-ROM or DVD-ROM from a local retailer or merchant on the Web.

Research has shown that, when properly evaluated and integrated into teaching at the point of instruction, multimedia applications are a highly effective teaching tool. When using a multimedia application, students become actively involved in the learning process instead of passive recipients of information. Interactive multimedia applications engage students by asking them to define their own paths through an application, which often lead them to explore many related topics.

Multimedia applications also are well suited for both physically impaired and learning disabled students. Students who are visually impaired, for example, benefit from the audio capabilities of multimedia applications, as well as the use of graphics and larger font sizes (Figure 8). Visual materials, such as graphics, animation, and video, also make learning easier for students who are hearing impaired. Many educational software companies also offer multimedia products with closed captioning or sign language to enhance the learning experience for hearing-impaired students. The ability of individuals to work, practice, and review at their own pace is a major benefit for the learning disabled.



**Figure 7**  
Dissecting a digitized frog eliminates the expense of actually dissecting a real frog in biology lab. These interactive programs allow you to view and remove organs and to make a movie of your progress. The pages are available in various languages.



**FIGURE 8**

Physically impaired and learning disabled students benefit from multimedia software rich in graphics, animation, and video. These students are using software developed by ClickIt!, which allows them to choose objects on the screen without using a mouse.





FIGURE 9

Geoffrey Chaucer's *Canterbury Tales* is among the thousands of public domain reference works and literature texts available from Project Gutenberg. One new text is added to the site almost daily.



FIGURE 10

Microsoft Encarta is a popular multimedia encyclopedia that includes graphics, audio, video, and Web links.

## Electronic Books

One type of **electronic book** is a digital text that gives the user access to information through links, which often are bold or underlined words. These electronic books have many of the elements of a regular book, including pages of text and graphics. Users generally click icons to turn pages of this type of electronic book. A table of contents, glossary, and index also are available at the click of a button. To display a definition or a graphic, play a sound or a video sequence, or connect to a Web site, they simply click a link.

A newer type of electronic book, called an **e-book**, uses a small book-sized computer that can hold up to 4,000 pages, or about 10 books' worth of text and small graphics by clicking a button, users move forward or backward, add notes, and highlight text stored in the e-book. Figure 6-7 on page 6.7 shows a photograph of an e-book. Readers also can view e-books on a small personal computer, such as a Palm™ handheld, with the text supplied from various sources. One of these sources is **Project Gutenberg**, which makes thousands of literary and reference texts and materials available free of charge to the general public (Figure 9).

Publishers are developing innovative methods of getting authors' words to the public. Some publishers, for example, create purely digital books sold online or in single copies when customers place orders through online book-sellers' and organizations' Web sites. None of these e-books is sold in a bookstore. For example, readers desiring chapters of Stephen King's novel, *The Plant*, ordered them for \$1 each through Amazon.com. Other publishers are creating **electronic paper**, which feels like real paper but is coated with electronic ink so that the characters can change. When you finish reading one of these books, you can plug it into a telephone line or a wireless receiver and then download another book.

## Electronic Reference Texts

An **electronic reference text**, sometimes called an **e-text**, is a digital version of a reference book, which uses text, graphics, sound, animation, and video to explain a topic or to provide additional information. The multimedia encyclopedia, Microsoft Encarta, for example, includes the complete text of a multivolume encyclopedia. In addition to text-based information, Microsoft Encarta includes thousands of photographs, animations, audio and video clips, and detailed illustrations (Figure 10). This array of multimedia information is accessible via menus and links.

### ELECTRONIC REFERENCE TEXTS

| Name                                  | Publisher          | URL                       | Description                                                                                                                                                                                             |
|---------------------------------------|--------------------|---------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| American Heritage Talking Dictionary  | Mattel Interactive | www.mattelinteractive.com | Uses a human-sounding voice to pronounce more than 90,000 words; contains more than 200,000 definitions, an integrated thesaurus, and 3,000 images, photographs, maps, and flags.                       |
| Compton's Encyclopedia                | Mattel Interactive | www.mattelinteractive.com | Features more than 40,000 articles, interactive science activities, monthly updates via the Internet, 360 views and virtual tours, more than 8,000 photos, and 100 videos, animations, and slide shows. |
| Encarta Encyclopedia Deluxe           | Microsoft          | microsoft.com             | Contains more than 42,000 articles, 170 videos and animations, a natural language search function, a dynamic timeline, virtual tours, 360-degree views, and text-to-speech capabilities.                |
| Library of the Future                 | AbleSoft           | kidsoft.com               | Contains descriptions of more than 5,000 literary works, authors' biographies, and film clips.                                                                                                          |
| The American Sign Language Dictionary | Multimedia 2000    | m-2k.com                  | Uses text, QuickTime video, animations, and illustrations to teach 2,600 signs, and includes learning games and lessons on fingerspelling.                                                              |

FIGURE 11 These e-texts use multimedia to clarify topics and supply additional information on thousands of subjects.

Many other reference texts (Figure 11) are used in a variety of fields and professions. Health and medicine are two areas in which multimedia reference texts play an important role. Instead of using volumes of books, health professionals and students rely on reference CD-ROMs and DVD-ROMs for information, illustrations, animations, and photographs on hundreds of health and first-aid topics.

How-To Guides

A variety of interactive multimedia applications is available to help individuals in their daily lives. These multimedia applications fall into the broad category of how-to guides. **How-to guides** are multimedia applications that include step-by-step instructions and interactive demonstrations to teach practical new skills (Figure 12). Much like the computer-based training applications used by businesses, how-to guides allow users to acquire and test new skills in a risk-free environment. The skills learned with a how-to guide, however, usually are oriented toward personal enrichment, rather than workplace skills.

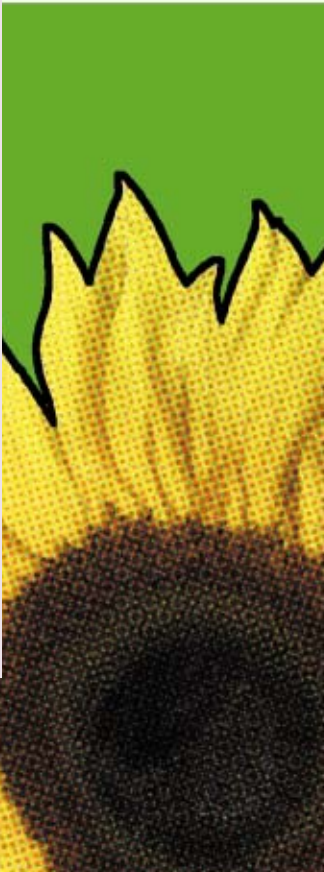
How-to guides can help with activities such as buying a home or a car, designing a garden, planning a vacation, improving a home, and repairing a car, or computer. The CD-ROMs in Figure 13 show the wide variety of instructional guides. Multimedia how-to guides also are available on DVD-ROM and the Web.



**FIGURE 12**  
Web users may learn American Sign Language via the HandSpeak online dictionary. The site features video clips of individuals signing words, including words having several definitions.

| CD-ROM HOW-TO GUIDES          |                    |                           |                                                                                                                                                                                                                                                       |
|-------------------------------|--------------------|---------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                          | Publisher          | Company URL               | Description                                                                                                                                                                                                                                           |
| 3-D Home Architect            | Mattel Interactive | www.mattelinteractive.com | Customize floor plans and then view your 3-D design. The plans analyze climate, community growth, and zoning ordinances.                                                                                                                              |
| Cosmopolitan Virtual Makeover | Mattel Interactive | www.mattelinteractive.com | Input a photograph and change your image by experimenting with 500 hairstyles, 300 cosmetic colors, and 200 accessories. You can save, print, and e-mail the finished products.                                                                       |
| Complete LandDesigner 3D      | SierraHome Network | sierra.com/sierrahome     | Design a garden or yard by choosing from 6,000 trees, shrubs, flowers, and vines or by viewing sample gardens, and view the plants as they grow and change with the seasons. A 3-D feature lets virtual gardeners view their creation from any angle. |
| MasterCook Deluxe             | SierraHome Network | sierra.com/sierrahome     | Prepare one of 5,000 dishes based on nutritional value and ingredients on hand. Watch instructional videos, and adjust the portions to the number of servings needed.                                                                                 |
| Teach Yourself PC Maintenance | Learn2.com         | learn2.com                | Four interactive multimedia CD-ROM tutorials explain such computer concepts as motherboard ports, the OS and CPU, hardware, installing SIMMs, modem standards, baud vs. bit rates, maintenance tools, keyboard cleaning, and the ScanDisk utility.    |

**FIGURE 13**  
These how-to guides teach useful skills by using videos, interactive demonstrations, and animations.



## Newspapers and Magazines

A **multimedia newspaper** and a **multimedia magazine** are digital versions of a newspaper or magazine distributed on CD-ROM, DVD-ROM, or via the World Wide Web. Today, many print-based magazines and newspapers have companion Web sites that provide multimedia versions of some or all of the magazine's printed content (Figure 14). An **electronic magazine**, or **e-zine**, is a digital publication available via the Web (Figure 15). These publications also can contain audio and video clips and animation.

Multimedia newspapers and magazines usually include the sections and articles found in their print-based versions, including departments, editorials, and more. Unlike printed publications, however, multimedia magazines and newspapers use many types of media to convey information. Audio and video clips, for example, can showcase recent album or movie releases, and animations can depict weather patterns or election results.

## Entertainment and Edutainment

Multimedia combines the media elements of television and interactivity, thus making it ideal for entertainment. Multimedia

### MULTIMEDIA MAGAZINES AND NEWSPAPERS

| Name                         | URL                                                                                      |
|------------------------------|------------------------------------------------------------------------------------------|
| Kyodo News (Tokyo)           | home.kyodo.co.jp                                                                         |
| National Geographic          | <a href="http://nationalgeographic.com/">nationalgeographic.com/</a>                     |
| New York Times               | <a href="http://nytimes.com/">nytimes.com/</a>                                           |
| Newsweek                     | <a href="http://msnbc.com/news/NW-front_Front.asp">msnbc.com/news/NW-front_Front.asp</a> |
| The Daily Telegraph (London) | <a href="http://www.telegraph.co.uk">www.telegraph.co.uk</a>                             |
| The Globe and Mail (Canada)  | <a href="http://globeandmail.ca">globeandmail.ca</a>                                     |
| The Star (Johannesburg)      | <a href="http://iol.co.za/html/frame_news.php">iol.co.za/html/frame_news.php</a>         |
| The Wall Street Journal      | <a href="http://wsj.com">wsj.com</a>                                                     |
| Time                         | <a href="http://time.com">time.com</a>                                                   |
| USA Today                    | <a href="http://usatoday.com/">usatoday.com/</a>                                         |
| Washington Post              | <a href="http://washingtonpost.com/">washingtonpost.com/</a>                             |

**FIGURE 14**

Multimedia magazines and newspapers from various countries use video and audio clips, animations, and other interactive multimedia tools to bring the world to our desktops.

**FIGURE 15**

E-zines are produced solely for the Web and often contain multimedia applications.

### E-ZINES

| Name                  | URL                                                                                                            | Description                                                                                                                             |
|-----------------------|----------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
| AMC's American Pop!   | <a href="http://ampop.com">ampop.com</a>                                                                       | Features programming devoted to vintage music, movies, toys, fashions, and pop culture. Shockwave and Flash are used extensively.       |
| Cybercycle Magazine   | <a href="http://motorcycleworld.com/powerpage.cfm?page_id=59">motorcycleworld.com/powerpage.cfm?page_id=59</a> | Bell & Howell sponsors this e-zine for motorcycle riders. Features new products and industry news.                                      |
| The Western Flyfisher | <a href="http://westernflyfisher.com/">westernflyfisher.com/</a>                                               | The first e-zine devoted to flyfishing contains numerous audio and video clips.                                                         |
| WebReference.com      | <a href="http://webreference.com">webreference.com</a>                                                         | Contains reference material on a wide variety of Web topics, including effective authoring, browsing, coding HTML, and designing sites. |
| ZENtertainment        | <a href="http://zentertainment.com">zentertainment.com</a>                                                     | Contains the latest entertainment news, including sections for music, TV, movies, toys, comics, and food.                               |

# MULTIMEDIA

computer games, for example, use a combination of graphics, audio, and video to create a realistic and entertaining game situation. Often the game simulates a real or fictitious world, in which users play the role of a character and have direct control of what happens in the game. The music industry also sells interactive multimedia applications on CD-ROM and DVD-ROM. Some interactive music CD-ROMs, for example, allow budding musicians to play musical instruments along with their favorite musician, read about the musician's life and interests, and even create their own versions of popular songs. Like interactive games, these applications give users a character role and put them in control of the application (Figure 16).

Other multimedia applications are used for **edutainment**, which is an experience meant to be both educational and entertaining. Many edutainment CD-ROMs and DVD-ROMs provide content for individuals of all ages, while others are created specifically to teach children in a fun and appealing way. Some of these edutainment applications are listed in Figure 17.

| ENTERTAINMENT APPLICATIONS |                         |                           |                                                                                                                                                  |
|----------------------------|-------------------------|---------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                       | Publisher               | URL                       | Description                                                                                                                                      |
| Backyard Baseball          | Humongous Entertainment | humongous.com             | Select players from 30 Major League Baseball teams or create your own team colors, ballpark, and strategy. Play online with other Windows users. |
| Dogz                       | Mattel Interactive      | www.mattelinteractive.com | Use voice recognition to train your Dogz to sit, fetch, or roll over; create custom scenes with the Play Scene Editor.                           |
| Motocross Madness          | Microsoft               | microsoft.com             | Perform stunts on your motorbike while you race up to eight opponents online via the MSN Gaming Zone.                                            |
| Roller Coaster Tycoon      | Hasbro Interactive      | hasbro-interactive.com    | Use 14 styles to construct roller coasters with accurate motion dynamics and physics principles. Analyze their excitement and nausea ratings.    |
| The Sims                   | Electronic Arts         | www.lapd2100.com          | Open-ended game lets you develop characters in a neighborhood, build their homes, and display your creations on the World Wide Web.              |

FIGURE 16

Entertainment applications rich in multimedia content provide fun and relaxation for children and adults.

| EDUTAINMENT APPLICATIONS          |                    |                                          |                                                                                                                                                                                                                                                |
|-----------------------------------|--------------------|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Name                              | Publisher          | URL                                      | Description                                                                                                                                                                                                                                    |
| Carmen Sandiego                   | Mattel Interactive | www.mattelinteractive.com                | Junior high students discover geography can be fascinating when they search for criminals in various locales using foreign languages and Internet links to maps and satellite pictures. The police chief gives updates using real-time video.  |
| James Cameron's Titanic Explorer  | 20th Century Fox   | foxinteractive.com/games/titanicexplorer | Watch James Cameron's dive expedition of the Titanic and use interactive 3-D models to examine the ship and the wreck. View a computer simulation of how the ship sank, and then browse through more than 1,200 pages of survivors' testimony. |
| Kaplan GMAT, GRE, and LSAT Deluxe | Encore Software    | encoresoftware.com                       | Personalized interactive lessons include hundreds of lessons and links to graduate schools.                                                                                                                                                    |
| Reader Rabbit                     | Mattel Interactive | www.mattelinteractive.com                | Teaches young children problem solving, decision making, and logic skills; learning technology monitors performance, offers help, and prints reports.                                                                                          |
| The Way Things Work               | DK Multimedia      | www.dk.com                               | Discover how more than 150 machines work by viewing animations, illustrations, and videos.                                                                                                                                                     |

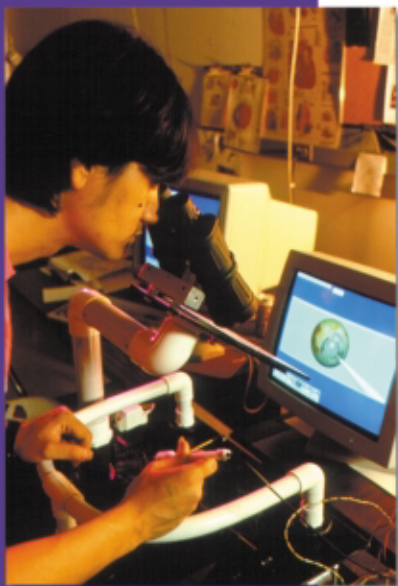
FIGURE 17

Edutainment applications give adults and children both education and entertainment.



**FIGURE 18**

A virtual reality system, which includes a stereomicroscope, helps a researcher practice eye surgery.



## Virtual Reality

**Virtual reality (VR)** is the use of a computer to create an artificial environment that appears and feels like a real environment and allows users to explore a space and manipulate the environment (Figure 18). In its simplest form, a virtual reality application displays a three-dimensional view of a place or object, such as a landscape, building, molecule, or red blood cell, which users can explore. Architects use this type of software to show clients how a building will look after a construction or remodeling project.

In more advanced forms, VR software users wear specialized headgear, body suits, and gloves to enhance the experience of the artificial environment (Figure 19). The headgear displays the artificial environment in front of both eyes. The body suit and the gloves sense motion and direction, allowing users to move, pick up, and hold items displayed in the virtual environment. Experts predict that eventually the body suits will provide tactile feedback, so users can experience the touch and feel of the virtual world.

Your first encounter with VR likely will be a virtual reality game such as a flight simulator. In these games, special visors allow you to see the computer-generated environment. As you walk around the game's electronic landscape, sensors in the surrounding game machine record your movements and change your view of the landscape accordingly. You also might use a Web-based VR application developed using **virtual reality modeling language (VRML)**. Web sites, such as the U.S. Capitol Web site in Figure 20, use virtual reality to allow you to take tours of a city, view real estate for sale, or interact with local attractions.

Some companies use VR for more practical, commercial applications, as well. Automobile companies, for example, have created virtual showrooms in which customers can view the exterior and interior of vehicles (Figure 21). In addition, airplane manufacturers are using virtual prototypes to test new models and shorten product design time. Telecommunications firms use personal computer-based VR applications for employee training. As computing power and the use of the Web increase, practical applications of VR will continue to emerge in education, business, and entertainment.

## Kiosks

A **kiosk** is a computerized information or reference center that allows users to select various options to browse through or find specific information. A typical kiosk is a self-service structure equipped with computer hardware

**FIGURE 20**

The U.S. Capitol Virtual Tours give visitors 360-degree views of the Senate and House of Representative chambers. Also included are details about objects found in those rooms and historical information.

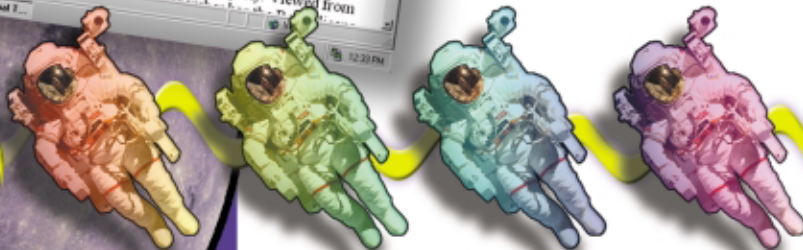
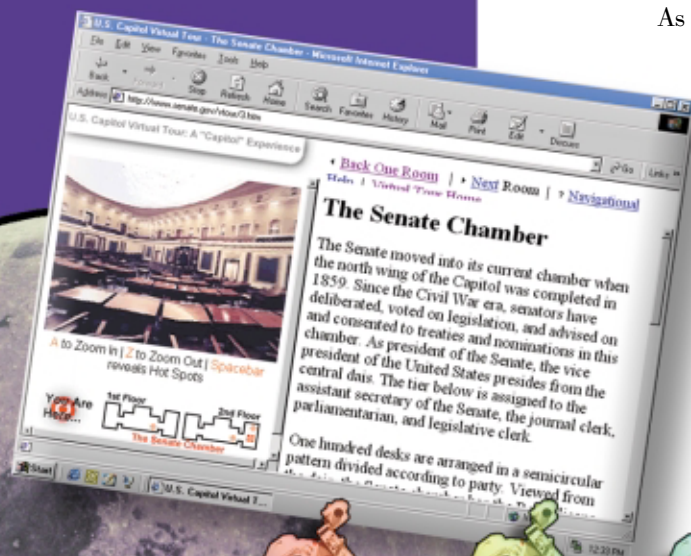




FIGURE 21

Lexus is one of the auto manufacturers that allows Internet users to build a specific car, including selecting colors and accessories, and then price their designed vehicle. Nearly one-half of U.S. households that buy vehicles turn to the Internet to research their purchase.



FIGURE 22

Seattle's Woodland Park Zoo features an interactive kiosk for its *Touch the Earth . . . Gently* exhibit. The 11-foot by 9-foot exhibit contains a laser disc player, touch screen monitor, and counters that calculate the net gain in world population and the net loss of wild animals' habitat.

and software. Kiosks often use touch screen monitors or keyboards for input devices and contain all of the data and information needed for the application stored directly on the computer.

Kiosks often provide information in public places where visitors or customers have common questions. Locations such as shopping centers, airports, museums, and libraries, for example, use kiosks to provide information on available services, product and exhibit locations, maps, and other information (Figure 22). Kiosks also are used for marketing. A kiosk might contain an interactive multimedia application that allows you to try options and explore scenarios related to a product or service. For example, you might be able to try different color combinations or take short quizzes to determine which product best meets your needs. The interactive multimedia involves customers with the product, thus increasing the likelihood of purchase.

## The World Wide Web

Multimedia applications also play an important role on the **World Wide Web**, which is the part of the Internet that supports multimedia. In fact, much of the information on the Web today relies on multimedia. Using multimedia brings a Web page to life, increases the types of information available on the Web, expands the Web's potential uses, and makes the Internet a more entertaining place to explore. As described in Chapter 2, the Web uses many types of media to deliver information and enhance a user's Web experience (Figure 23). Graphics and animations reinforce text-based content and provide updated information. Online radio stations, movie rental sites, and games use audio and video clips to provide movie and music clips or to deliver the latest news.

Many of the multimedia applications previously described, including computer- and Web-based training, newspapers, e-zines, games, and virtual reality, are deliverable via the Web. New multimedia authoring software packages include tools for creating and delivering multimedia applications via the World Wide Web. Some of these authoring software packages allow users to create applications in the Windows environment and then convert them to HTML and Java for Web use.

## DEVELOPING MULTIMEDIA APPLICATIONS

You can create a multimedia application using a variety of software applications. With PowerPoint, for example, you can create a presentation that combines text, graphics, animation, and audio and video clips (Figure 24). Developing these applications follows a standard process with several phases. While some of the terminology is different, the basic activities completed within each phase closely follow those of the program development



FIGURE 23

CNN is one of the many sites on the Web that incorporates multimedia features to report daily news events, weather, health tips, and entertainment.



FIGURE 24

This PowerPoint slide features an animated sun and a sound file with the crash of waves.

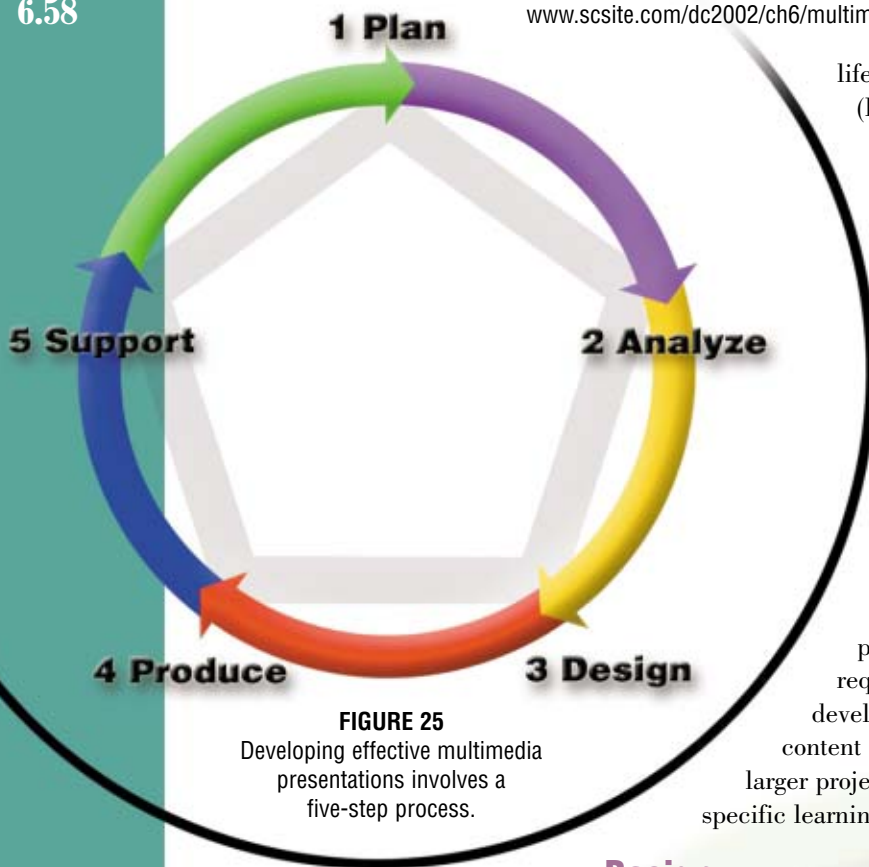


**FIGURE 25**  
Developing effective multimedia presentations involves a five-step process.

life cycle: plan, analyze, design, produce, and support (Figure 25).

## Plan

The first step in developing multimedia applications is to **plan** the project. This phase requires reviewing the application's goal, allocating resources, and identifying individuals who will participate on the project development team. Larger projects, such as commercial CD-ROM and DVD-ROM products, usually involve a project team, including a producer, an art director, an interface designer, a content designer, and the programmer.

## Analyze

When team members carefully **analyze** the project, they determine specific objectives and requirements for the application. For small projects, the developer may play a variety of roles, which may include content developer, interface designer, and programmer. For larger projects with specific learning objectives, analysis is extremely important.

## Design

Once basic requirements have been determined, the **design** phase begins. A vital tool for the project team is a flowchart, or map, which includes all of the various media elements in the application and serves as a blueprint to which the project team or individual developer can refer. Another important tool is the **project script**, which provides detailed information to supplement the flowchart and records how the various media elements will be used in the production. Screen design is another crucial part of designing an effective multimedia application. The colors and layout used for individual screens greatly influence the overall effect of the finished product.

## Produce

Project team members **produce** the multimedia application by creating the various media elements used in the application and combining them using multimedia authoring software. Artists develop original graphics and animations using drawing and illustration software, add photographs by using a digital camera, a PhotoCD, or a scanner, and record digital video and audio clips using recording devices and a video capture or sound card. Authoring begins when they have obtained all of the media elements. Finally, the developer tests the program to verify it performs according to design specifications.

## Support

During the **support** phase, the developer reviews the project to ensure all objectives have been met. In addition, errors are identified and corrected. At this point, plans may be made to modify or enhance the application with additional features. If so, the cycle begins again at the planning phase.

## Multimedia Authoring Software

Developing an interactive multimedia application involves using **multimedia authoring software** to combine text, graphics, animation, audio, and video into an application. Authoring programs also allow you to design interactive areas on the screen that respond to user input. Once various media elements are added to the program, the multimedia authoring software assigns relationships and actions to elements. The programs also help create a structure that lets the user navigate through the material presented.

One of the more important activities of the production phase of multimedia development is selecting the multimedia authoring software package. Factors to consider when selecting a multimedia authoring software package are quality of application developed, ease of use, clear documentation, responsiveness of vendor's service



and technical support, compatibility with other applications, ease of programming, functionality, and system requirements for both user and developer.

Most popular authoring packages share similar features and are capable of creating similar applications. The major differences exist in the ease of use for development. Four popular multimedia authoring packages — Authorware, Director, Flash, and ToolBook — are described in Figure 26. Authorware, Director, and ToolBook use a programming language, whereas Flash is a graphical development environment.

## FEATURE SUMMARY

Interactive multimedia distributed on CD-ROM, DVD-ROM, and the World Wide Web, is changing dramatically the ways we work, learn, and play. We view multimedia business presentations at work. In addition, we can define our own learning paths, investigate topics in depth, and get immediate feedback from drill-and-practice or exploration activities. We learn by using computer-based training, Web-based training, distance learning, classroom and special education, electronic books and reference texts, how-to guides, virtual reality, and multimedia magazines and newspapers. We release our frustrations and have fun with entertainment and edutainment interactive multimedia programs. Well-designed multimedia applications also tend to engage and challenge users, thus encouraging us to think independently and creatively.

| MULTIMEDIA AUTHORIZING SOFTWARE |                 |                 |                                                                                                                                                                                                   |
|---------------------------------|-----------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Product                         | Publisher       | URL             | Use                                                                                                                                                                                               |
| Authorware                      | Macromedia      | macromedia.com  | Uses flowchart metaphor to build a multimedia application.                                                                                                                                        |
| Director                        | Macromedia      | macromedia.com  | Uses a theater or movie production metaphor to build a multimedia application. Three integrated windows — Cast, Score, and Paint — are used to create and sequence text and other media elements. |
| Flash                           | Macromedia      | macromedia.com  | Nonprogrammers can create dazzling Web sites that display across a user's entire screen — regardless of monitor size — and include input, interactivity, sounds, music, graphics, and animations. |
| ToolBook                        | click2learn.com | click2learn.com | Uses a graphical user interface and an object-oriented approach to design applications using basic objects such as buttons, fields, graphics, backgrounds, and pages.                             |

**FIGURE 26**

These popular multimedia authoring software packages allow users to create interactive elements that respond to user input.

